

Annual Conference

RSC Biomaterials Chemistry Special Interest Group

University of Birmingham

2016

7-8th January 2016

Sport, Exercise and Rehabilitation Sciences Building,
University of Birmingham,
Edgbaston,
Birmingham,
B15 2TT

ROYAL SOCIETY
OF CHEMISTRY

Conference chair
Prof. Liam Grover

Organising committee

Prof. Liam Grover, Dr. Richard Williams



#RSCbham2016



UNIVERSITY OF
BIRMINGHAM

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2016

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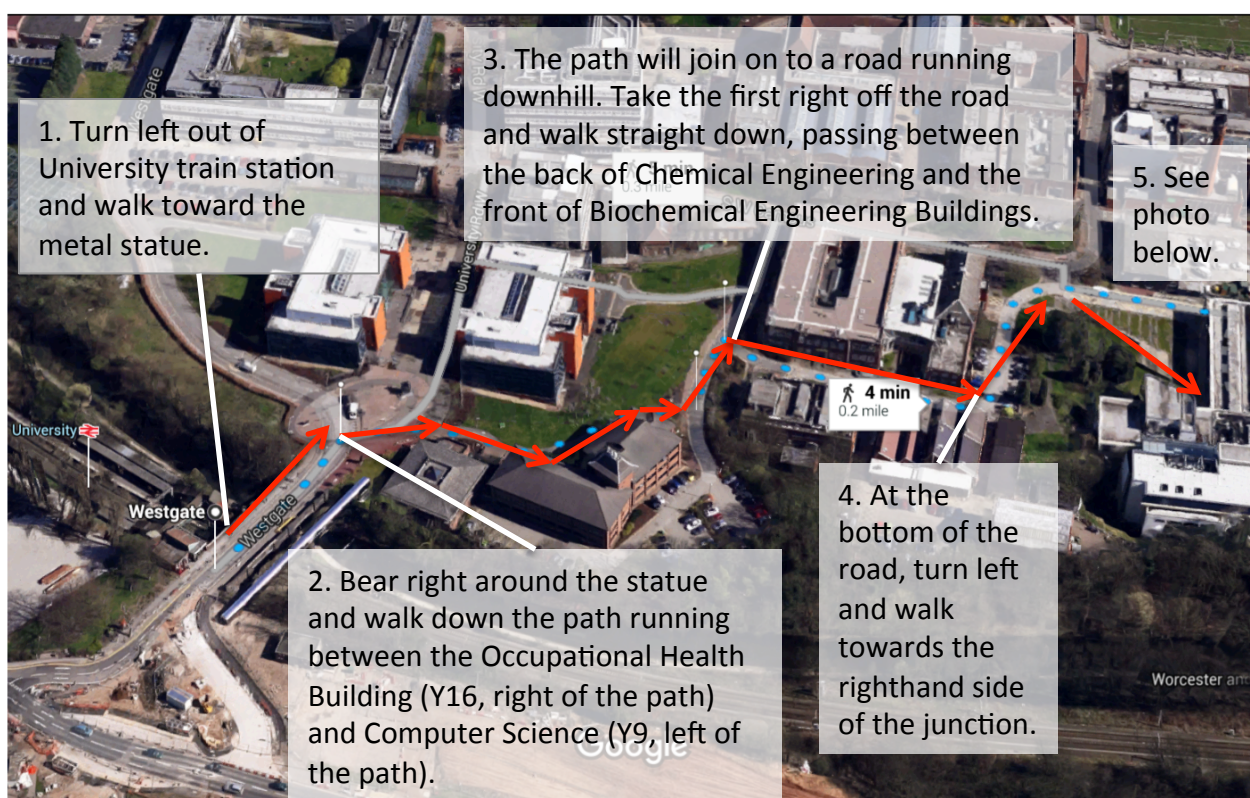
We gratefully acknowledge the support of our sponsors

Contents

| | |
|--|----|
| Getting to and from the Conference | 1 |
| Welcome | 2 |
| Programme | 3 |
| Useful information | 10 |
| train timetable: Birmingham New Street ↔ University | |
| Edgbaston Campus map | |

Directions to the venue

The conference will be held at the Sports, Exercise and Rehabilitation Sciences Building at the University of Birmingham (Edgbaston Campus). Trains from Birmingham New Street station to University run approximately every 10 minutes. The directions below describe how to then walk from University train station to the conference venue (5 minutes). Delegates who wish to travel to the conference by taxi could ask to be dropped off at University train station and also follow the directions below. A full map of the campus is included at the back of this Programme.



Imagery ©2015 Google, Map data ©2015 Google 20 m

5 (see photo, right). As you approach the junction, look square right and you will see a black sign for Sports and Exercise Science (conference venue), which is the large silver building in the background at the bottom of a stepped path. Enter the venue via the entrance on the right at the bottom of the steps.



Image capture: Sep 2011 © 2015 Google

Welcome

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Dear Delegates,

It is an immense pleasure to host the 2016 Annual Conference of the RSC Biomaterials Chemistry Special Interest Group at the University of Birmingham and to welcome your participation in the event. The RSC Biomaterials Chemistry Special Interest Group was set up in 2005 to provide a focus for groups in UK universities and industry working on the synthesis and characterisation of biomaterials. The group aims to enhance the understanding of the chemistries underlying the use of biomaterials in applications including prostheses, drug delivery and regenerative medicine.

Annual meetings of the group are designed to promote biomaterials chemistry research and development, enhance existing links, foster new collaborations and spread expertise. Meetings give participants the opportunity to present new work, discuss data and help to shape the future of research in this important and growing area of chemistry.

The response from the biomaterials research community has been excellent for this year's meeting with 18 different institutions, including two from mainland Europe, presenting their work on areas ranging from molecular scale engineering of materials to the development of analytical tools for biomaterials research. It is also a great honour to host talks from five world leading researchers in the field. The breadth of work to be presented at this conference reflects the strong multidisciplinary nature our field has evolved towards, which will no doubt underpin the major breakthroughs in regenerative medicine and the development of ground-breaking healthcare technologies.

We hope that you will enjoy the conference and the city of Birmingham.

”

Prof. Liam Grover, University of Birmingham.
(Conference Chair)

Programme

Thursday 7th January

09:30 - 10:00 Coffee and Registration

10:00 - 10:10 Welcome – Prof. Liam Grover (University of Birmingham)

Session 1 (10:10 – 12:10). Soft Materials: Understanding and tailoring soft material chemistry and structure 1.

10:10 – 10:40 Keynote talk

Prof. Jürgen Groll (Department of Functional Materials in Medicine and Dentistry, University of Würzburg, Germany).

10:40 – 10:55 A family of protein-superglues for programmable biomaterial assembly and cell triggering.

Gianluca Veggiani, Mark Howarth (Department of Biochemistry, University of Oxford, UK)

10:55 – 11:10 Synthesis of novel mucoadhesive microgels *via* post-polymerisation modification.

Dr. Ruairi P Brannigan (School of Chemistry, Food and Pharmacy, University of Reading, UK), Dr. Michael T Cook, Prasopchai Tonglairoum, Aiganyam Azhkeyeva, Prof. Vitaliy V Khutoryanskiy.

11:10 – 11:25 Effect of Phenylalanine/Alanine Sequence in Self-assembling β -sheet Octapeptides.

Andrew Smith (School of Materials and Manchester Institute of Biotechnology, University of Manchester, UK), Jacek Wychowanec, Stephen Boothroyd, Aline F. Miller and Alberto Saiani.

11:25 – 11:40 Thermally Triggered Injectable Hydrogel Which Induces Mesenchymal Stem Cell Differentiation to Promote Regeneration of the Intervertebral Disc.

Abbey Thorpe (Biomolecular Sciences Research Centre, Sheffield Hallam University, UK), Christopher Sammon, Christine L Le Maitre.

11:40 – 11:55 Development of an Inherently Radiopaque Drug-Eluting Bead for Image-guided Locoregional Treatment of Liver Tumours.

Koorosh Ashrafi, Yiqing Tang, Hugh Britton, Orianne Domenge, Delphine Blino, Ayele H. Negussie, Andrew Mikhail, David L. Woods, Venkatesh Krishnasamy, Elliot B. Levy, Karun V. Sharma, Bradford J. Wood, Sean L. Willis, Matthew R. Dreher, Andrew L. Lewis (Biocompatibles UK Ltd, Camberley, UK).

Programme

Session 1 continued

11:55 – 12:10 Controlling doxorubicin release from β -sheet peptide hydrogels by finely-tuning drug-peptide interactions.

Mohamed A. Elsayw (School of Materials, University of Manchester, UK), Luis A. Castillo Díaz, Jacek Wychowanec, Aline F. Miller, Alberto Saiani.

12:10 – 13:10 Lunch and Poster Session

Session 2 (13:10 – 14:40). Tissue Chemistry: Characterisation and manipulation of cellular and tissue chemistry

13:10 – 13:55 Keynote talk

Prof. Melinda Duer (Department of Chemistry, University of Cambridge, UK).

13:55 – 14:10 Polyphosphate Dissolution of Hydroxyapatite – A Potential Treatment for Pathological Mineralisation.

Neil Eisenstein (Chemical Engineering, University of Birmingham, UK), Sarah Stapley, and Liam Grover.

14:10 – 14:25 Micro X-Ray Fluorescence Mapping of Calcium Phosphates and Mineralised Tissues: Understanding Biomaterial Chemistry and Disease Mechanisms.

Richard L. Williams (School of Chemical Engineering, University of Birmingham, UK), Neil Eisenstein, Rajpal Nandra and Liam M. Grover.

14:25 – 14:40 Cationised Proteins as Agents to aid Tissue Engineering and Regenerative Medicine.

Robert C. Deller (School of Cellular and Molecular Medicine, University of Bristol), James P. Armstrong and Adam W. Perriman.

14:40 – 14:55 3D ToF-SIMS Imaging of Primary Neuronal Cultures .

Sebastiaan Van Nuffel (School of Pharmacy, University of Nottingham, UK), Christopher Parmenter, David Scurr, Noah Russell and Mischa Zelzer.

14:55 – 15:25 Coffee

Programme

Session 3 (15:25 – 16:55): Inorganic Materials

15:25 – 16:10 Keynote talk

Prof. Jake Barralet (Director of Orthopaedic Research, McGill University, Canada).

16:10 – 16:25 Novel Self-setting Bone Wax from Calcium Phosphate Cement / Poly(ethylene glycol) Mixtures.

Theresa Brückner (Department of Functional Materials in Medicine and Dentistry, University of Würzburg, Germany), Martha Schamel, Alexander C. Kübler, Jürgen Groll, Uwe Gbureck .

16:25 – 16:40 Structure-property relationships in biomaterials from computer modelling.

J. K. Christie (Department of Materials, Loughborough University, UK), R. I. Ainsworth, D. Di Tommaso, N. H. de Leeu.

16:40 – 16:55 *In situ* characterization of chemical composition in an alginate/CaP composite.

Sindre Bjørnøy (Department of Physics, Norwegian University of Science and Technology, Norway), David C. Bassett and Pawel Sikorski.

16:55 – 17:55 Poster Session

Conference Dinner at 18:45

International Convention Centre,
Broad Street, Birmingham, B1 2EA
(Directions on next page)

Directions to the Conference Dinner

Location

The ICC Birmingham
Broad Street
Birmingham
B1 2EA
www.theicc.co.uk/



© The ICC 2015

From the University of Birmingham

Train: Trains from University train station to Birmingham New Street run approximately every 10 minutes. The ICC is normally a 10 minute walk from the station, but current redevelopment works and footpath diversions in the area may extend the walk to 15 minutes. A set of walking directions accounting for these diversions can be accessed via this [link](#)

Car/Taxi: Driving directions can be found [here](#) and takes 15 minutes with moderate traffic

From Radisson Blu Hotel (Birmingham City Centre)

The ICC is around a 15 minute walk from the Radisson Blu Hotel. Walking directions can be accessed via this [link](#)

Driving directions can be found [here](#) and takes 3 minutes with moderate traffic

Programme

Friday 8th January

09:00 – 09:30 Coffee

Session 1 (09:30 – 11:15). Soft Materials: Understanding and tailoring soft material chemistry and structure 2.

09:30 – 10:00 Keynote talk

Prof. Pawel Sikorski (Department of Physics, NTNU, Norway).

10:00 – 10:15 A study of doubly crosslinked microgel composites and their properties.

Zhengxing Cui (School of Materials, The University of Manchester, UK), and Brian R. Saunders.

10:15 – 10:30 pH-Responsive Doubly Crosslinked Nanogel / Worm Composite Gels.

Amir H. Milani (Polymer Science Research Group, School of Materials, University of Manchester, U.K.), Liam P. D. Ratcliffe, Daman J. Adlam, Judith A. Hoyland, Anthony J. Freemont, Steven P. Armes, Brian R. Saunders.

10:30 – 10:45 Investigating Hysteresis in Thermoresponsive Assemblies.

Lewis D. Blackman (University of Warwick, UK), Matthew I. Gibson and Rachel K. O'Reilly.

10:45 – 11:00 Biocatalytic Co-Assembly to Design Dynamic Nanostructures.

Yousef M. Abul-Haija (WestCHEM/Department of Pure & Applied Chemistry and Technology & Innovation Centre, University of Strathclyde, UK) and Rein V. Ulijn.

11:00 – 11:15 In situ Screening of Polymeric Amphiphiles for siRNA Delivery.

Francisco Fernandez-Trillo (School of Chemistry, University of Birmingham, UK), Daniel N. Crisan, Juan M. Priegue, José Martínez-Costas, Juan R. Granja, and Javier Montenegro.

11:15 – 11:45 Coffee

Programme

Session 2 (11:45 – 13:15). Inorganic Materials 2, High throughput research methods and models

11:45– 12:15 Keynote talk

Prof. Pamela Habibović (MERLN Institute for Technology-inspired Regenerative Medicine, Maastricht University, Netherlands).

12:15 – 12:30 Novel Fully Resorbable Calcium Phosphate Microspheres for Biomedical Applications.

Ifty Ahmed (Advanced Materials Research Group, Faculty of Engineering, University of Nottingham, UK), Uresha Patel, Zakir Hossain, Virginie Sottile, David Grant and Brigitte Scammell.

12:30 – 12:45 Investigating the Interactions of Nanoscale Calcium Phosphates with Polymer additives.

Laura Shallcross (Polymers and Biomaterials Chemistry Laboratories, University of Sheffield , UK), Sarahfranziska Stahl, Prof. Paul Hatton, Dr Sebastian Spain.

12:45 – 13:00 High-Throughput Method for Identifying 3D Printable Ink Formulations for Biomaterial Manufacturing.

Iria Louzao (School of Pharmacy, University of Nottingham, UK), Clive Roberts, Cameron Alexander, Christopher Tuck, Ian Ashcroft, Ricky Wildman, Richard Hague, Morgan Alexander.

13:00 – 13:15 Development and optimisation of an *in vitro* model of the basal ganglia.

Matthew Dunn (Institute for Science and Technology in Medicine, Keele University, UK), Munyaradzi Kamudzandu, Rosemary Fricker, Paul Roach.

13:15 – 14:15 Lunch and Poster Session

Programme

Session 3 (14:15 – 16:00). Bioresponsive surfaces: Surface modification, particles and fabrication

14:15 – 14:45 Keynote talk

Prof. Frank Müller (Friedrich-Schiller-University, Jena, Germany).

14:45 – 15:00 Electroactive Biomaterials for Drug Delivery and Tissue Engineering.

John G. Hardy (Materials Science Institute & Department of Chemistry, Lancaster University, UK) and Christine E. Schmidt.

15:00 – 15:15 Enzyme-responsive polyion complex nanoparticles for antimicrobial delivery.

Ignacio Insua (Schools of Chemistry, University of Birmingham, UK), Anne Marie Krachler, Anna F.A. Peacock and Francisco Fernandez Trillo.

15:15 – 15:30 Control of protein activity on surfaces using stimuli-responsive nanocomposite films.

Simone Basile (School of Chemical Engineering, University of Birmingham, UK), Paula M. Mendes.

15:30 – 15:45 Synthetic Defensins: Novel Antibacterial Agents for Surface Attachment.

Felicity de Cogan (Institute of Inflammation and Ageing, University of Birmingham, UK), Leigh Townsend, Sameed Mohammed, [Anna Peacock, Mark Webber, Ann Logan.

15:45 – 16:00 Influence of mould design on ice-templated scaffold structures

Anke Husmann (CCMM, University of Cambridge, UK), Kendell Pawelec, Clare Burdett, Serena Best and Ruth Cameron.

16:00 – 16:15 Closing summary

16:15 – 16:30 AGM

End of Conference

Train times



Valid from Thursday 7 January 2016 to Friday 8 January 2016

Outward

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Outward Continued

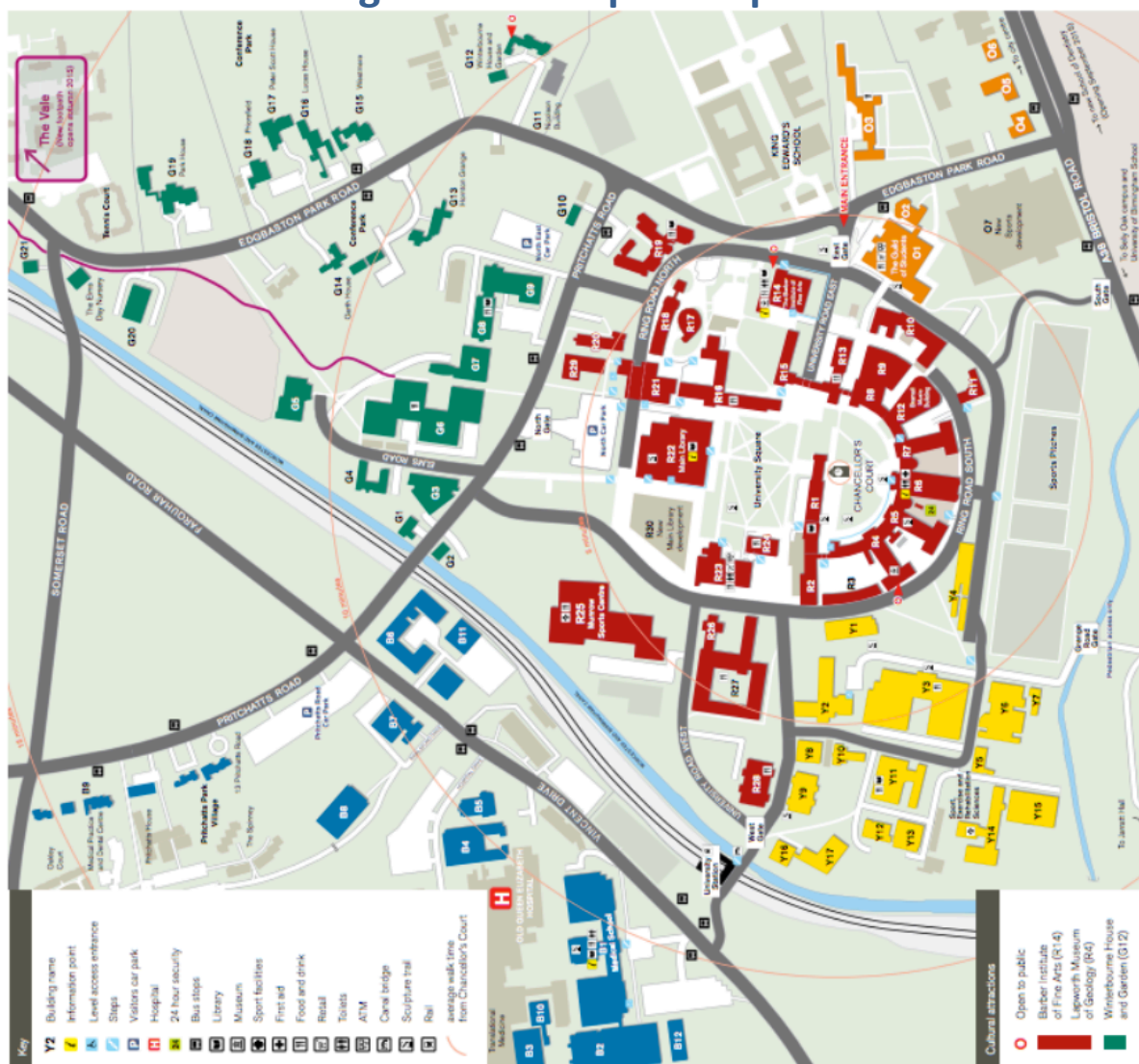
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| Birmingham New Street | dep. | 10:52 | 11:02 | 11:12 | 11:22 | 11:30 | 11:32 | 11:42 | 11:49 | 11:52 | 12:02 | | |
| University (Birmingham) | arr. | 10:59 | 11:09 | 11:19 | 11:29 | 11:36 | 11:39 | 11:49 | 11:55 | 11:59 | 12:09 | | |
| Duration | | 0:07 | 0:07 | 0:07 | 0:07 | 0:06 | 0:07 | 0:07 | 0:06 | 0:07 | 0:07 | | |
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| Catering | | | | | | <input checked="" type="checkbox"/> | | | | | | | |

Return

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Useful information

Edgbaston Campus Map



Edgbaston Campus Map

Index to buildings by zone

| Red Zone | |
|-------------|---|
| R1 | Law Building |
| R2 | Frankland Building |
| R3 | Hills Building |
| R4 | Aston Webb – Lapworth Museum (Reopening 2016) |
| R5 | Aston Webb – B Block |
| R6 | Aston Webb – Great Hall |
| R7 | Aston Webb – Student Hub (Opening September 2015) |
| R8 | Physics West |
| R9 | Nuffield |
| R10 | Medical Physics |
| R11 | Bramall Music Building |
| R12 | Pyrring Building |
| R13 | Barber Institute of Fine Arts |
| R14 | Watson Building |
| R15 | Arts Building |
| R16 | Ashley Building |
| R17 | Strachan Building |
| R18 | Education Building |
| R19 | J G Smith Building |
| R20 | Murhead Tower |
| R21 | Main Library |
| R22 | University Centre |
| R23 | Staff House |
| R24 | Manrow Sports Centre |
| R25 | Geography |
| R26 | Biosciences Building |
| R27 | Murray Learning Centre |
| R28 | Postgraduate Centre |
| R29 | (Under construction) |
| R30 | New Library (under construction) |
| Blue Zone | |
| B1 | Medical School |
| B2 | Institute of Biomedical Research including IBR West |
| B3 | Wellcome Clinical Research Facility |
| B4 | Robert Aiken Institute for Clinical Research |
| B5 | CRUK Institute for Cancer Studies and Denis Howell Building |
| B6 | Research Park |
| B7 | 90 Vincent Drive |
| B8 | Henry Wellcome Building for Biomolecular NMR Spectroscopy |
| B9 | Medical Practice and Dental Centre |
| B10 | Advanced Therapies Facility |
| B11 | BioHub Birmingham |
| B12 | Health Sciences Research Centre (HSRC) |
| Green Zone | |
| G1 | 32 Pritchatts Road |
| G2 | 31 Pritchatts Road |
| G3 | European Research Institute |
| G4 | 3 Elms Road |
| G5 | Computer Centre |
| G6 | Metalurgy and Materials |
| G7 | IRC Net Shape Laboratory |
| G8 | Gabbert Kapp Building |
| G9 | 32 Pritchatts Road |
| G10 | 54 Pritchatts Road |
| G11 | Nicolson Building |
| G12 | Winterbourne House and Garden |
| G13 | Westmere |
| G14 | Priorfield |
| G15 | Park House |
| G16 | Elms Plant |
| G17 | Elms Day Nursery |
| Yellow Zone | |
| Y1 | Old Gymnasium |
| Y2 | Haworth Building |
| Y3 | Mechanical and Civil Engineering Building |
| Y4 | Terrace Huts |
| Y5 | Estates West |
| Y6 | Maintenance Building |
| Y7 | Grounds and Gardens |
| Y8 | Chemistry West |
| Y9 | Computer Science |
| Y10 | Alta Bioscience |
| Y11 | Chemical Engineering |
| Y12 | Biochemical Engineering |
| Y13 | Chemical Engineering Workshop |
| Y14 | Sport, Exercise and Rehabilitation Sciences |
| Y15 | Civil Engineering Laboratories |
| Y16 | Occupational Health |
| Y17 | Public Health |
| Orange Zone | |
| O1 | The Guild of Students |
| O2 | St Francis Hall |
| O3 | University House |
| O4 | Ash House |
| O5 | Beech House |
| O6 | Cedar House |
| O7 | New Sports Development (under construction) |